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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/076,741	02/13/2002	Rajan Kumar	GDS_NP_2001_003	2063
7590	03/30/2005		EXAMINER LAM, ANN Y	
Rajan Kumar 18 Buford Road Robbinsville, NJ 08691			ART UNIT 1641	PAPER NUMBER

DATE MAILED: 03/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/076,741

Applicant(s)

KUMAR, RAJAN

Examiner

Ann Y. Lam

Art Unit

1641

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 10 is/are pending in the application.
- 4a) Of the above claim(s) 4-9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant's election of group I (claims 1-3 and 10) in the reply filed on February 17, 2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 4-9 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention.

Claim Objections

Claims 1-3 and 10 are objected to because of the following informalities:

In claim 1, line 1, "Any" should be --A--;

In claim 1, line 1, either "the" or "said" should be deleted for being redundant;

In claims 2, 3 and 10, line 1 respectively, "A method" should be --The method--;

In claims 2, 3 and 10, "comprising" should be substituted with --wherein--

(along with any appropriate changes in grammar.)

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-3 and 10 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The preamble of claim 1 recites a method for analysis of biomolecules. However, the body of the claims do not recite what are the steps of the analysis. (There is no analysis step for example of detecting the presence or quantity of a material, and there is no step for how the analysis is performed.) (Perhaps the preamble should be amended.)

Claim 10, line 2, recites "the microfluidic device". The claim lacks antecedent basis for this limitation. (Applicant used the term "microfluidic chip", as opposed to "microfluidic device" in claim 1.) Claim 10 is also vague since it is not clear as to which microfluidic device (or chip) Applicant is referring. (The first microfluidic chip or the second microfluidic chip?)

Also, claim 10, line 2, recites the limitation "the sample". There is insufficient antecedent basis for this limitation.

Claim 10 is vague because it does not recite any limitations that further limit the method of claim 1. A recitation of a "use" is not considered a limitation. A "use" is not a positive recitation of a method step.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu, 6,533,914, in view of Briscoe et al., 6,544,734, and further in view of Mehta et al., 6,632,655.

Liu discloses the invention substantially as claimed. More specifically, Liu discloses that a fluid sample can be transferred from one chip to another chip for further processing such as sample treatment or separation of molecules within the samples (col. 4, lines 42-55.) Liu teaches that capillaries can be used to communicate between two or more chips (see col. 4, lines 38-39, and 47-48.) However, Liu does not specifically disclose that the material being transferred from one to chip to another chip includes a substrate. (The substrate limitation is disclosed by Pfost et al. as beads, as described further below.)

The following more specifically describes how Liu discloses the invention substantially as claimed.

With respect to claim 1, Liu discloses a method for analysis of biomolecules (see col. 4, lines 25-35, and lines 55-63) comprising removal of a fluid from one microfluidic chip and insertion of the fluid into a second microfluidic chip for further processing or analysis (col. 4, lines 49-55.)

As to claim 2, the fluid is inserted into and removed from more than two chips (see col. 4, line 39.)

As to claim 10, the method is used for capture and isolation of molecules of interest from the sample flowing in the microfluidic chip (see col. 4, line 54.) (The disclosed step of separation in column 4, line 54, is considered the isolation step.)

Liu however does not specifically disclose a substrate, such as beads, in the fluid sample being transferred from one chip to another chip.

Briscoe et al. discloses this step however. Briscoe et al. discloses a microfluidic device using beads to enhance separation of DNA from other cell contents, and subsequent elution of the DNA and detection of the DNA (see col. 2, lines 35-41.) The Briscoe et al. particles, or beads, are considered the substrates as claimed by Applicant. (Applicant's definition of a substrate on page 7 of the specification is "a solid material that can be inserted into and removed from a microfluidic chip".)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use beads as taught by Briscoe et al. in the Liu chip, or microfluidic device, because Briscoe et al. teaches that beads provide the advantage of

convenience in separation of biomaterials such as DNA from a sample for subsequent analysis of the material.

Moreover, Mehta et al. teaches that the combination of the teachings of Liu and Briscoe et al. will work because Mehta et al. teaches that beads coupled to reagents can be transferred into a microfluidic device through a capillary (col. 15, lines 3-7 and col. 2, line 66 – col. 3, line 12), such as the Liu capillary.

As to claim 3, Briscoe et al. and Mehta et al. teach use of a plurality of beads and thus meets the limitation of two substrates (i.e., beads) being removed from two different microfluidic chips and being combined for further processing in a third microfluidic chip (see Briscoe et al. col. 2, line 37 and see Mehta et al., col. 4, line 39, and 46-55.)

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Anderson et al., 6,713,309, teaches tubular substrates for immobilization of probes. Vann, 6,635,470, discloses tubular substrates with immobilized probes, wherein the substrates are immersed in a sample in channels. Knapp et al., WO 98/45481, discloses use of electropipettors to transfer reagents into a microfluidic device.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ann Y. Lam whose telephone number is 571-272-0822. The examiner can normally be reached on M-Sat 11-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on 571-272-0823. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A.L.



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3/20/05